

PATENT COOPERATION TREATY

From the
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

To:

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PCT *m*

WRITTEN OPINION (PCT Rule 66)

Date of mailing
(day/month/year) 08.11.2004

Applicant's or agent's file reference
WO 21.1066

REPLY DUE **within 3 month(s)**
from the above date of mailing

International application No.
PCT/EP 03/13146

International filing date (day/month/year)
21.11.2003

Priority date (day/month/year)
31.12.2002

International Patent Classification (IPC) or both national classification and IPC
E21B47/08

HT. 8/02/2005

Applicant
SERVICES PETROLIERS SCHLUMBERGER et al.

1. This written opinion is the **first** drawn up by this International Preliminary Examining Authority.
2. This opinion contains indications relating to the following items:
 - I ☒ Basis of the opinion
 - II ☐ Priority
 - III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
 - IV ☐ Lack of unity of invention
 - V ☒ Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
 - VI ☐ Certain documents cited
 - VII ☐ Certain defects in the international application
 - VIII ☐ Certain observations on the international application
3. The applicant is hereby **invited to reply** to this opinion.

When? See the time limit indicated above. The applicant may, before the expiration of that time limit, request this Authority to grant an extension, see Rule 66.2(d).

How? By submitting a written reply, accompanied, where appropriate, by amendments, according to Rule 66.3. For the form and the language of the amendments, see Rules 66.8 and 66.9.

Also: For an additional opportunity to submit amendments, see Rule 66.4.
For the examiner's obligation to consider amendments and/or arguments, see Rule 66.4 bis.
For an informal communication with the examiner, see Rule 66.6.

If no reply is filed, the international preliminary examination report will be established on the basis of this opinion.
4. The final date by which the international preliminary examination report must be established according to Rule 69.2 is: 30.04.2005

Name and mailing address of the international preliminary examining authority:



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WRITTEN OPINION

JC20 Rec'd PCT/PTO 23 JUN 2005
International application No. PCT/EP 03/13446

I. Basis of the opinion

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this opinion as "originally filed"*):

Description, Pages

1-13 as originally filed

Claims, Numbers

1-15 as originally filed

Drawings, Sheets

1/10-10/10 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
☐ the language of publication of the international application (under Rule 48.3(b)).
☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
☐ filed together with the international application in computer readable form.
☐ furnished subsequently to this Authority in written form.
☐ furnished subsequently to this Authority in computer readable form.
☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
☐ the claims, Nos.:
☐ the drawings, sheets:

5. ☐ This opinion has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).

6. Additional observations, if necessary:

V. Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**1. Statement**

Novelty (N)	Claims	1-6, 8, 10-12, 14, 15 (no) / 7, 9, 13 (yes)
Inventive step (IS)	Claims	1-15 (no)
Industrial applicability (IA)	Claims	1-15 (yes)

2. Citations and explanations**see separate sheet**

POINT V

V-1. Reference is made to the following document/s/:

D1: EP-A-0 657 622 (BAKER HUGHES INC) 14 June 1995 (1995-06-14)

D2: US-A-4 692 908 (EKSTROM MICHAEL P ET AL) 8 September 1987 (1987-09-08)

D3: US-A-4 665 511 (RODNEY PAUL F ET AL) 12 May 1987 (1987-05-12)

V-2. D1 / D2 / D3 respectively disclose:

a method for determining a velocity of ultrasound propagation in a drilling fluid in a downhole environment (D1: col.3, l.41-44 / D2: col. 7, l. 61 / D3: col.1, l.34-37), comprising:

emitting an ultrasound pulse (D1: col.6, l.52-56 / D2: col.8, l.22-25 / D3: col.5, l.61-62) into the drilling fluid in a borehole using a first ultrasound transducer (D1: 34 / D2: 76 / D3: 40);

detecting the ultrasound pulse after the ultrasound pulse has travelled through the drilling fluid a distance (D1: RTT, col.7, l.20-26 / D2: fig.5, S / D3, col.6, l.29-32);

determining a travel time for the ultrasound pulse to travel the distance; and

determining the velocity of ultrasound propagation from the distance and the travel time (D1: col.8, l.44-col.9, l.3 / D2: col.7, l.64-67 / D3: col.6, l.42-52).

The subject-matter of claim 1 does therefore not meet the requirements of novelty in the sense of Art. 33(2) PCT.

V-3. D1 / D2 / D3 respectively also disclose:

an apparatus for determining a velocity of ultrasound propagation in a drilling fluid in a downhole environment (D1: 24 / D2: 32 / D3: 20), comprising:

a first ultrasound transducer (D1: 34 / D2: 76 / D3: 40) disposed in a tool; and circuitry (D1: 36 / D2: 88 / D3: 66) for controlling a timing of an ultrasound pulse transmitted by the first ultrasound transducer and for measuring a time lapse between ultrasound transmission and detection after the ultrasound pulse has travelled a distance (D1: col.7, l.20-26 / D2: col.8, l.22-25 / D3: col.6, l.42-52).

The subject-matter of claim 11 does therefore not meet the requirements of novelty in the sense of Art. 33(2) PCT.

V-4. D1 / D2 / D3 also disclose subject-matter of claims 2-6, 8, 10, 12, 14, 15 as following shows:

- 2 : D1: col.6, l.52-56 / D2: col.7, l.64-66 / D3: col.6, l.45-50.

- 3 : D3: 50.

- 4 : D3: distance d (the wording of claim 4 does not specify an a radial or axial offset, therefore claim 4 lacks novelty).
- 5 : D3: col. 6, l.42-52.
- 6 : D2: fig.5, channel 78
- 8 : D2: second ultrasound transducer 64 disposed on the same tool as 76, both 64 and 76 having offset front faces (the meaning of predetermined offset distance is unclear).
- 10 : D1: fig.1 / D2: 32 / D3: fig.3
- 12 : D2: 64 / D3: 42
- 14 : D2: fig.1 / D3: fig.3
- 15 : D2: second ultrasound transducer 64 disposed on the same tool as 76, both 64 and 76 having offset front faces (the meaning of predetermined offset distance is unclear) / D3: distance d (the wording of claim 4 does not specify an a radial or axial offset, therefore claim 4 lacks novelty).

The subject-matter of claims 2-6, 8, 10, 12, 14, 15 does therefore not meet the requirements of novelty in the sense of Art. 33(2) PCT.

V-5. Dependent claims 7, 9, 13 do not contain any features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect of inventive step in the sense of Art. 33(3) PCT.

V-6. If the applicant files amended claims, following should be taken into account:

- Rule 6.3b)i) and ii) PCT: correct two part form of independent claims with regard to D1-D3 respectively.
- Rule 5.1a)ii) and iii) PCT with reference to the documents D1-D3 and their disclosure: the subject-matter of the independent claims should include some technical difference over the disclosure of documents D1-D3, considered in combination, so as to permit a finding in the light of the problem-solution approach (see PCT GL 3 IV-8.5) that the claims have an inventive step over the prior art. The applicant is requested to state how said technical difference implies an inventive step over the prior art.
- Art. 6 PCT in combination with PCT GL 3 III-4.3 a: statement in the description p.13, l.1-4 has to excised.
- Rule 5.1a)iii) PCT: description in conformity with the new claims.
- Article 34 (2) b) PCT: the applicants are requested to identify in their reply those passages of the application as originally filed which form a basis for the amendments. For the sake of efficiency, it is requested that an additional copy containing **handwritten** amendments be forwarded together with any clear copy

**WRITTEN OPINION
SEPARATE SHEET**

International application No. PCT/EP 03/13146

replacement pages.